CIS342 Computer Network Fundamentals Spring 2018

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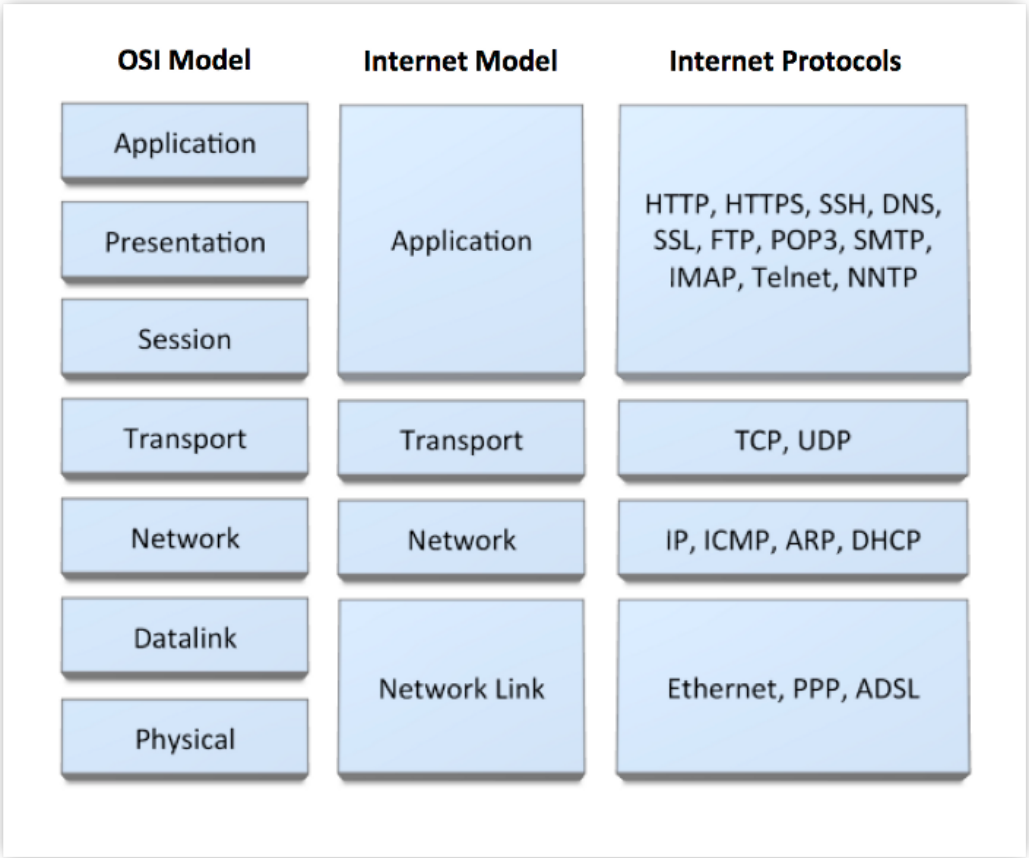
Credits: 3

Class Time: Tuesday-Thursday
Ott-182 12:05 to 1:30



Internet Network Stack Models and Examples

Course Philosophy:

Who questions much, shall learn much, and retain much. – Francis Bacon

Good judgment comes from experience, and experience comes from bad judgment. – Frederick P. Brooks

Own your education. – Joe Hoffert

It is our duty and joy at all times and in all places to give You thanks and praise, Holy Father, heavenly King, Almighty and eternal God. – The Liturgy of the Church Of Nigeria (Anglican Communion)

Sharing an Adventure

Educational Paradigm

Yet Another Educational Paradigm

Prerequisites

- CIS 221 (Data Structures) or CIS 222 (Object Oriented Programming)

I. Course Description

This course studies computer networks from the point of view of the Local Area Network and network interconnection. An overview of the TCP/IP layer models is presented with emphasis on packet transfer across networks. Common applications such as electronic mail, file sharing, web servers, Instant Messaging and VOIP are considered. Real world protocols are covered and contemporary network operation systems are reviewed. The role of the network administrator is covered regarding network security, disaster prevention and recovery.

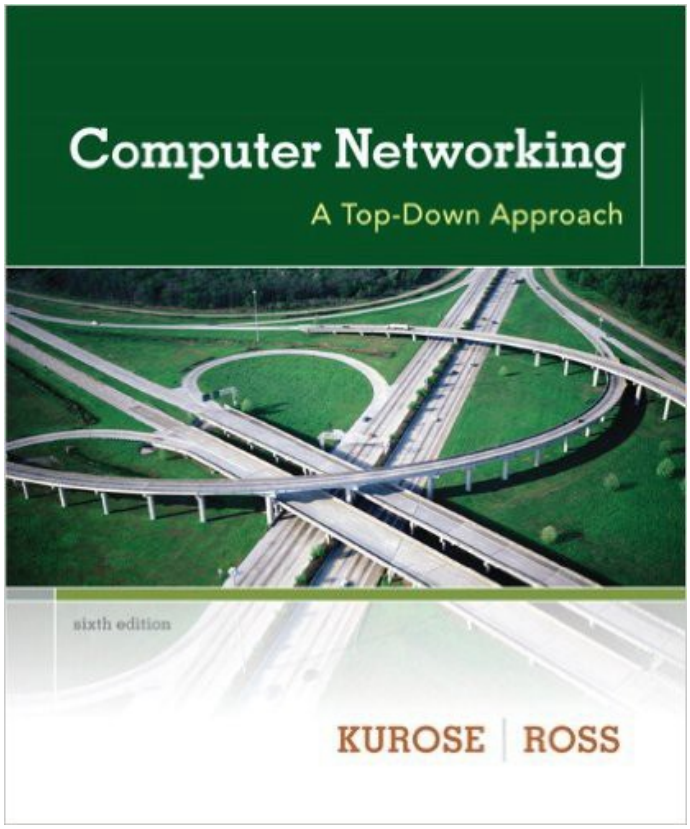
II. Course Objectives

After taking this course, the students should be able to:

- Analyze and define the TCP (transmission control protocol) networking model.
- Identify and describe the requirements for building, testing and securing local area networks
- Design and develop network aware applications using the latest programming standards.

III. Required Text and Materials

Computer Networking: A Top-Down Approach, 6th Edition, James F. Kurose & Keith W. Ross, © 2013 Pearson, ISBN-13: 9780132856201.



IV. Grade Distribution

Reporting Weekly Hours	**65 pts**	**Grading Scale**
Participation	**85 pts**	**A: 94 – 100%**
Presentations & Papers	**100 pts**	**A-: 90 – 93%**
Programming/Homework Assignments	**350 pts**	**B+: 87 – 89%**
Midterm Examination	**150 pts**	**B: 83% – 86%**
Final Examination	**250 pts**	**B-: 80 – 82%**
	_____	**C+: 77 – 79%**
Total	**1000 pts**	**C: 73 – 76%**
		C-: 70 – 72%
		D+: 67 – 69%
		D: 61 – 66%
		F: 0% – 60%

V. Description of Assignments

- **Reporting Weekly Hours:** At the end of each week (*i.e.*, by Saturday 11:59 p.m.), students are to submit the number of hours they spent on this course outside of class time. These time submissions are graded only in that any submission with the information will receive the full 5 weekly points. For example, if one student reports that he or she spent zero (0) hours on the course outside of class and another reports that he or she spent 15 hours on the course outside of class, both will receive the 5 weekly points.

  The expected average time a student should spend on any course is 2 hours out of class for every hour in class. For a 3-hour class this translates to 6 hours per week *on average* outside of class. **You can expect to spend more time than this in a course that is directly related to your major** (which this course likely is).

- **Attendance:** The classroom times are meant to be interactive discussions eliciting comments, questions, and concerns and providing greater depth to the textbook material. The expectation for the course is that students will not only attend but also participate in the discussions. Before the start of most every class, students will submit three questions (in Learning Studio) relevant to the reading assignment. This approach is meant to foster learning in a group environment.

  A part of participation is taking *quizzes, which* will be given after covering a portion of a chapter in class (*i.e.*, based on what's covered during the week). The quiz is expected to take no more than 20 to 30 minutes. The material covered on the quizzes will be taken directly from the classroom discussions, the assignments, and the textbook. The quizzes are meant for formative assessment where you evaluate what you think you have learned already (rather than summative assessment where you are evaluated on what you are expected to know). The quizzes are good study guides for exams.

- **Presentations & Papers:** During the course of the semester each student will submit two papers (both 3 page papers not including references) and make two presentations related to computer networks.

  [50 pts] The 1st presentation and paper will relate to computer networks in general. The 3-page paper should be based on the presentation. Any topics related to the textbook, exercises, or class discussions are valid. Other topics will need the approval of the instructor. A generalized rubric for presentations and papers is available.

The 1st presentation and paper also need to include a reference to a relevant research paper (available from the ACM or IEEE Xplore websites). Please contact the library if you have problems accessing the full text of the paper.

At a minimum, the first presentation and paper should address the following questions:

- What is the challenge?
- How is the challenge relevant to computer networking?
- Why is the challenge important (or not)?
- Why is the challenge considered interesting to the presenter (*i.e.*, why did you select it)?
- What research is being done regarding the challenge (*i.e.*, how is your ACM/IEEE research paper incorporated into your paper & presentation)?

[50 pts] The 2nd presentation and paper will relate to the EduSource field trip. This paper and presentation will be much like the previous paper and presentation with the addition of material relevant to the EduSource field trip. For example, material could be included that addresses any explicit or implicit network protocols that are used by EduSource or that would be applicable to the types of applications they develop or their development process.

Inherent in this 2nd presentation and paper is the expectation that the student will attend the EduSource field trip. Part of your grade is based on this expectation. The Excused Chapel/Absence form and the Release of Liability form will be available when details of the trip are completed.

Each presentation is expected to last **10 minutes** with 5 minutes afterwards for questions. Using a presentation software package is appropriate (*e.g.*, Microsoft PowerPoint, OpenOffice Impress) but not required. Other forms of disseminating information (*e.g.*, videos, poems, dramas, video games) are also encouraged.

- **Programming/Homework Assignments:** Throughout the semester there will be several homework and programming assignments. These assignments are meant to give the students practical experience in the content covered in the textbook and the classroom discussions. All assignments should be submitted electronically.

- **Midterm Examination:** The midterm examination is scheduled for ***Thursday, Feb. 22*** **during the scheduled class time starting at 12:05**. The midterm examination will be based on material from the classroom and exercise discussions, textbook, and quizzes. I will give you a study guide a week before the midterm exam. The midterm exam will include a proper subset of the questions from the study guide.

- **<u>Final Examination (During Exam Week):</u>** The final examination is scheduled for ***Tuesday, Apr. 26, 2018 from 10:00 to 11:50.*** The final examination will be comprehensive and cover material from both before and after the midterm. It will be based on the classroom discussions, the textbook, and quizzes. I will give you study guide a week before the exam. The final exam will include a proper subset of questions from the study guide.
- **<u>For assignments and due dates please see Appendix at the end of this syllabus.</u>**

VI. Late work: Work turned in after the due date & time will receive a mark of 0 (unless there are extenuating circumstances, e.g., death of a family member).

This policy is meant to help the students in regards toaccountability.

VII. Academic Honesty:

Do not share or copy work – including code (unless told to). You are encouraged to discuss ideas, approaches, comments, etc. but your work must be your own. You should type in all the code yourself. Do not copy and paste from another source. (You may copy and paste code that you have created for this class for reuse.)

VIII. Syllabus Content:

The professor reserves the right to make changes to this syllabus, if deemed necessary. All changes will be provided to the students orally or in writing before the implementation of the change.

Appendix: Assignments, Calendar, and Due Dates

Week	Topic	Chapter Reading	Assignments are due by 11:59 Saturday evening of that week.
1 1/7	Intro to Course	1	
2 1/14	Application Layer	2	**Due 1/20** ○ Lab - Ch. 1 Intro to Wireshark ○ Review Questions: R1-20 ○ Quiz Chapter 1 ○ Report Weekly Hours
3 1/21	Application Layer	2	**Due 1/27** ○ Lab - Ch. 2 HTTP Wireshark ○ Review Questions: R21-27 ○ Topic Approval for 1st paper ○ Report Weekly Hours
4 1/28	Transport Layer	3	**Due 2/3** ○ Prog - Ch. 2 Web Server ○ Review Questions: R1-R8 ○ Quiz Chapter 2 ○ Report Weekly Hours
5 2/4	Transport Layer (cont.)	3	**Due 2/10** ○ Lab - Ch. 3 Wireshark Lab: Exploring TCP ○ Review Questions: R9-19 ○ Report Weekly Hours
6 2/11	Network Layer	4	**Due 2/17** ○ Prog - Ch. 3 Implementing a Reliable Transport Protocol ○ Quiz Chapter 3 ○ Report Weekly Hours
7 2/18	Network Layer (cont.)	4	**Due 2/24** ○ Lab – Ch. 4 Wireshark Lab ○ Prog - Ch. 4 Distance Vector Routing ○ Report Weekly Hours
2/22	**MIDTERMS (Chapter 1-3)**		
8 2/25	1st Presentations		**Due 3/3** ○ Papers and presentations submitted ○ Report Weekly Hours
9	**Spring Break (March 4-10)**		

Week	Topic	Chapter Reading	Assignments are due by 11:59 Saturday evening of that week.
10 3/11	Link Layer	5	**Due 3/17** ○ Review Questions: R1-8 ○ Quiz Chapter 4 ○ Report Weekly Hours ○ Topic Approval for 2nd paper
11 3/18	Link Layer	5	**Due 3/24** ○ Lab - Ch. 5 Wireshark Lab ○ Review Questions: R9-16 ○ Report Weekly Hours
12 3/25	Wireless and Mobile Net	6	**Due 3/31** ○ Lab - Ch. 6 Wireshark Lab ○ Review Questions: R1-21 ○ Quiz Chapter 5 ○ Report Weekly Hours
13 4/1	Security in Networks	8	**Due 4/7** ○ Review Questions: R1-5, R9-18 ○ Prog - Ch. 2, Web Proxy Server ○ Quiz Chapter 6 ○ Report Weekly Hours
14 4/8	Security in Networks	8	**Due 4/14** ○ Lab - Ch. 8 Wireshark Lab ○ Review Questions: R19-33 ○ Report Weekly Hours
15 4/15	2nd Presentations	9	**Due 4/21** ○ Papers and presentations due ○ Quiz Chapter 8 ○ Report Weekly Hours
16 4/22	Final Review 4/24		
4/26	FINALS (Excluding Chapters 7 and 9) 10:00AM OH-182		